JAPAN

EDICT OF GOVERNMENT

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JIS B 6512 (1989) (English): Test methods for performance and accuracy of rip saws

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The citizens of a nation must honor the laws of the land.

Fukuzawa Yukichi

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JAPANESE INDUSTRIAL STANDARD

Test Methods for Performance and Accuracy of Rip Saws

JIS B 6512—1989

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by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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JAPANESE INDUSTRIAL STANDARD J I S

Test Methods for Performance and Accuracy of Rip Saws

B 6512-1989

1. Scope

This Japanese Industrial Standard specifies test method related to the function, running performance and rigidity, and the inspection methods on static accuracy and machining accuracy of the rip saws specified in No. 6141 in JIS B 0114 of 200 mm or over to 560 mm or under in diameter of circular saws to be used for wood working.

Remark: In this Standard, units and numerical values given in { } are in accordance with the conventional units, and are appended for informative reference.

2. Methods for Functional Tests

The functional tests of the rip saws shall be in accordance with Table 1.

Table 1. Functional Tests

No.	Test item	Test method
1	Electric equipment	Before and after the running test, examine the insulating condition once each.
2	Start, stop and running operation of main spindle	At an appropriate main spindle speed of rotation, carry out 10 times of start and stop continuously to examine the smoothness and reliability of actions.
3	Changing operation of main spindle speed of rotation	Change the main spindle speed of rotation over entire marked speeds of rotation to examine the smoothness of actions and the reliability of indications of the operating device.
4	Start, stop and running operation of feeding device of material	At an appropriate feed speed, carry out 10 times of start and stop continuously to examine the smoothness and reliability of actions.
5	Changing operation of feed speed	Carry out speed change, over entire marked feed speeds and on 3 feed speeds of the lowest, intermediate and highest for that of stepless variable speed system, to examine the smoothness of actions and reliability of indications of the operating device.

Applicable Standards and Reference Standards: See page 10.

Table 1 (Continued)

No.	Test item	Test method
6	Manual feed operation	By using the manual feed handle, examine the smoothness and uniformity of actions throughout overall length of motions, and further rotate the sensitive feed handle several times to examine the smoothness and uniformity.
7	Ascending and descending and clamping operations and automatic stopping operation of main spindle	Ascend and descend the main spindle to examine the smoothness and uniformity of actions throughout the overall length of motion, and to examine the reliability of clamping and smoothness of actions of the clamping device at both ends and centre of motions. In addition, examine the smoothness and reliability of actions of the automatic stopping device at the both ends of motions.
8	Attaching and detaching of circular saw	Examine the reliability and smoothness of the attaching, detaching and clamping screw of circular saw.
9	Pressing device	Examine the smoothness and reliability of function.
10	Safety device	Examine the reliability of safety functions for operators and protective functions for machine [see JIS B 6507 and JIS B 6600].
11	Lubricating device	Examine the reliability of such functions as oil tightness and proper distribution of oil quantity.
12	Oil hydraulic pressure equipment	Examine the reliability of such functions as oil tightness and pressure regulation.
13	Pneumatic pressure equipment	Examine the reliability of such functions as air tightness and pressure regulation.
14	Accessories	Examine the reliability of functions.

Remark: For a rip saw which is not provided with any function concerned, the test items corresponding to these in Table 1 are to be omitted.

3. Methods for Running Tests

3.1 No Load Running Test Rotate the main spindle, continue running for 30 to 60 min, measure the required electric power and noise after bearing temperatures have been stabilized, record on respective items specified in Table 2 Record Format 1, and, at the same time, observe by sense of touch that no abnormal vibration exists.

Furthermore, the measurement of the noise shall be in accordance with JIS B 6521.

Table 2. Record Format 1

No.	Time of measurement o'clock, minute	Main spindle speed of rotation min^{-1} {rpm}		Temperature ℃			Required electric power			Noise dB (A)	Description
				Main bearings							
		Marking	Actual measurement	Left	Right	Room temperature	Voltage V	Current A	Input kW		

Remarks 1. For a rip saw provided with the speed change device of the main spindle speed of rotation, records shall be taken on at least 2 levels of speeds of rotation including the maximum speed of rotation.

2. Regarding the measuring conditions of noise, these shall be recorded in the description column.

3.2 Load Running Test Carry out the cutting of the test member, measure the required electric power and noise, record on respective items specified in Table 3 Record Format 2, and observe, at the same time, by the sense of touch that no abnormal vibration exists and the condition of cut surface.

The measurement of the required electric power shall be carried out by changing the thicknesses of the test member at a constant feed speed or changing the feed speeds at a constant thickness of the test member.

Table 3. Record Format 2

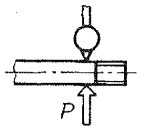
No.	Test member					Tool						Cutting conditions			Required electric power					Noise dB (A)	Description
	Dimensions																Input				
	Length mm	Width mm	Thickness mm	Species of tree or type of wood	Water content %	Diameter mm	Thickness mm	Set width mm	Number of teeth	Tooth shape	Material of cutting edge	Main spindle speed of rotation min^{-1} {rpm}	Cutting speed m/min	Feed speed m/min	Voltage V	Current A	No load P_0 kW	Load P_1 kW	Cutting power kW $P_1 - P_0$		
										Annexed otherwise											

Remarks 1. Cutting direction of the test member, saw way width and measuring conditions of noise shall be recorded on the description column.

2. The tooth shape shall be illustrated and entered with its main dimensions.

4. Method of Rigidity Test The rigidity test of the rip saw shall be in accordance with Table 4.

Table 4. Rigidity Test

No.	Test item	Measuring method	Figure for measuring method
1	Flexural rigidity of main spindle system	Applying a fixed test indicator to the end part (side face) of the main spindle, apply a load (P) to the main spindle in vertical direction, alternately from confronting direction each other([1]), and measure the deflection of the main spindle. Carry out this measurement on vertical and horizontal directions respectively.	

Note ([1]) The position to which the load is to be applied shall be the nearer position to the main spindle end as far as possible, and the distance from the main spindle end shall be recorded.

Remarks 1. The rigidity test of the machines of the same design shall be represented by the results of a test which has been carried out on a representative set, and for others it may be omitted.

2. Regarding the size of the load (P), measurement shall be carried out by applying the recommended load (P) by the manufacturer, and this load (P) shall be recorded.

3. This measurement shall be carried out with rotating the main spindle, after the bearing temperatures have been stabilized.

5. Methods for Static Accuracy Inspections

The static accuracy inspections of the rip saws shall be in accordance with Table 5.

Table 5. Static Accuracy Inspections

Unit: mm

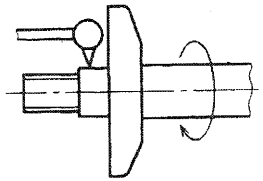
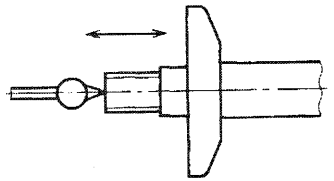
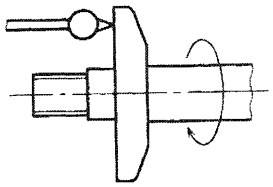
No.	Inspection item	Measuring method	Figure for measuring method	Permissible value
1	Runout of main spindle	Apply a test indicator to the outer peripheral face of the circular saw fitting part, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.02
2	Axial movement of main spindle	Apply a test indicator to the tip end of the main spindle, shake the main spindle in axial direction(2), and consider the maximum difference of the readings of the test indicator to be the measured value.		0.03
3	Runout of flange surface	Apply a test indicator to the flange surface, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.02 per 100 in diameter

Table 5 (Continued)

Unit: mm

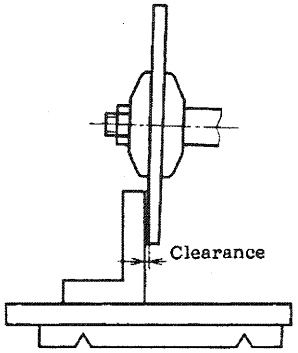
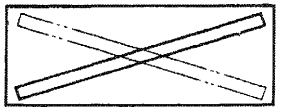
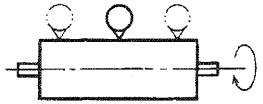
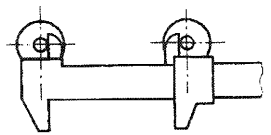
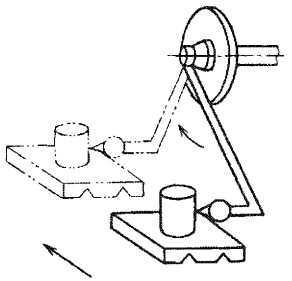
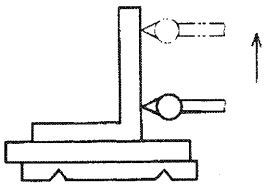
No.	Inspection item	Measuring method	Figure for measuring method	Permissible value
4	Squareness of flange surface with upper surface of caterpillar	Attach a test plate([3]) to the flange surface, place a straightedge on the upper surface of the caterpillar, stand a square on it, apply this to the test plate surface, measure clearances with a feeler gauge, and consider the maximum value to be the measured value([4]).		0.04 per 100
5	Straightness of ruler surface	Place a straightedge([5]) diagonally on the ruler surface, measure clearances with a feeler gauge, and consider the maximum value to be the measured value.		0.03 per 300
6	Runout of feed roll	Applying a test indicator to the centre and both ends of the roll, rotate the roll manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.05

Table 5 (Continued)

Unit: mm

No.	Inspection item	Measuring method	Figure for measuring method	Permissible value
7	Parallelism of feed rolls	Measure the interval between the both ends of adjacent roll shafts with a vernier callipers, and consider the maximum difference of readings to be the measured value.		0.10
8	Squareness of main spindle centre line and caterpillar's travelling direction([6])	Stand a cylindrical block on the upper surface of the caterpillar, carry out measurement by applying a test indicator which has been fixed to the main spindle to this and carry out the same measurement by travelling the caterpillar while keeping the above situation, and consider the maximum difference of readings of the test indicator to be the measured value([7]).		0.02 per 200
9	Squareness of ascending and descending motion of main spindle with respect to upper surface of caterpillar	Place a straightedge on the upper surface of the caterpillar, stand a square on it, apply a test indicator which has been fixed to the main spindle to this and ascend the main spindle from a descending position, and consider the maximum difference of the readings of the test indicator during ascending to be the measured value([5]).		0.04 per 100

Notes ([2]) The force to shake the main spindle in axial direction shall be approx. 150 N {approx. 15 kgf}.

([3]) Regarding the size of the test plate, it shall be such a size that it is not impedimental in inspection, and regarding the permissible value of its straightness, it shall be $(0.007 + L/100000)$ mm.

Where, L indicates the diameter (mm) of the test plate.

([4]) This measurement shall be carried out by applying the square to the position where the influence of the runout of the flange surface is the smallest.

([5]) In the case where the measuring distance is smaller than the reference, the numerical value of the permissible value of measurement shall be converted in proportion to the distance.

([6]) This measurement is not applicable to that of which main spindle does not protrude to the upper surface of the table.

([7]) In taking the readings, the sliding part shall be fastened firmly.

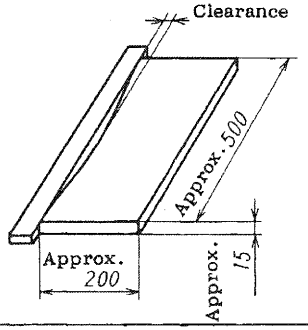
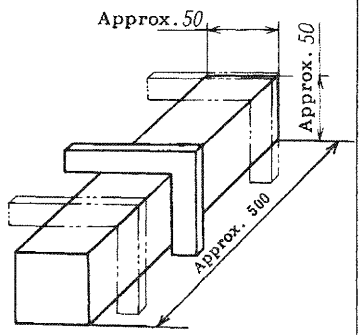
Remark: A rip saw which is not provided with any functions concerned, inspection items corresponding to these in Table 5 are to be omitted.

6. Inspection Methods on Machining Accuracies

The machining accuracy inspections of the rip saws shall be in accordance with Table 6.

Table 6. Machining Accuracy Inspections

Unit: mm

No.	Inspection item	Measuring method	Figure for measuring method	Permissible value
1	Straightness of cut surface	After the side face([8]) of the test member has been cut, apply a straightedge to the cut surface and measure clearances throughout its overall length with a feeler gauge, and consider the maximum value to be the measured value.		0.05 per 500
2	Squareness of cut surface	Cut one surface of the test member, place its surface on the upper surface of the caterpillar, cut another neighbouring surface, apply a square to the cut surface and measure the clearance with a feeler gauge. Carry out this measurement at 3 places of the centre and both ends, and consider the maximum value to be the measured value.		0.05 per 50

Note ([8]) That surface of member which is narrower in width.

Remark: The test member shall be treated with a necessary pre-processing in advance.

Applicable Standards:

JIS B 0114-Glossary of Terms for Wood Working Machinery

JIS B 6507-General Code of Safety for Wood Working Machinery

JIS B 6521-Methods of Measurement for Noise Emitted by Wood Working Machinery

JIS B 6600-Safety Standards for Construction of Rip Saw and Gang Rip Saw

Reference Standards:

JIS B 6501-Test Code for Performance and Accuracy of Wood Working Machinery

JIS Z 8203-SI Units and the Use of their Multiples and of Certain other Units

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